

TOSHIBA

MICROWAVE SEMICONDUCTOR TECHNICAL DATA

MICROWAVE POWER GaAs FET

TIM5359-45SL

FEATURES :

■ LOW INTERMODULATION DISTORTION

$IM_3 = -45 \text{ dBc}$ at $P_o = 35.5 \text{ dBm}$

Single Carrier Level

■ HIGH POWER

$P_{1dB} = 46.5 \text{ dBm}$ at 5.3 GHz to 5.9 GHz

■ HIGH GAIN

$G_{1dB} = 9.0 \text{ dB}$ at 5.3 GHz to 5.9 GHz

■ BROAD BAND INTERNALLY MATCHED

■ HERMETICALLY SEALED PACKAGE

RF PERFORMANCE SPECIFICATIONS ($T_a = 25^\circ\text{C}$)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1 dB Compression Point	P_{1dB}	$V_{DS} = 10 \text{ V}$ $f = 5.3\text{-}5.9 \text{ GHz}$	dBm	46.0	46.5	—
Power Gain at 1 dB Compression Point	G_{1dB}		dB	8.0	9.0	—
Drain Current	I_{DS}		A	—	9.6	10.8
Gain Flatness	ΔG		dB	—	—	± 0.8
Power Added Efficiency	η_{add}		%	—	41	—
3rd Order Intermodulation Distortion	IM_3	Note 1	dBc	-42	-45	—
Channel-Temperature Rise	ΔT_{ch}	$V_{DS} \times I_{DS} \times R_{th} (c-c)$	$^\circ\text{C}$	—	—	100

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	g_m	$V_{DS} = 3 \text{ V}$ $I_{DS} = 11.0 \text{ A}$	mS	—	8000	—
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3 \text{ V}$ $I_{DS} = 170 \text{ mA}$	V	-1.0	-2.5	-4.0
Saturated Drain Current	I_{DSS}	$V_{DS} = 3 \text{ V}$ $V_{GS} = 0 \text{ V}$	A	—	24	31
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS} = -500 \text{ } \mu\text{A}$	V	-5	—	—
Thermal Resistance	$R_{th} (c-c)$	Channel to Case	$^\circ\text{C/W}$	—	0.8	1.2

Note 1 : 2 tone Test. $P_{out} = 35.5 \text{ dBm}$ Single Carrier Level.

Recommended gate resistance(R_g) : $R_g = R_{g1}(10 \text{ } \Omega) + R_{g2}(18 \text{ } \Omega) = 28 \text{ } \Omega$ (MAX)

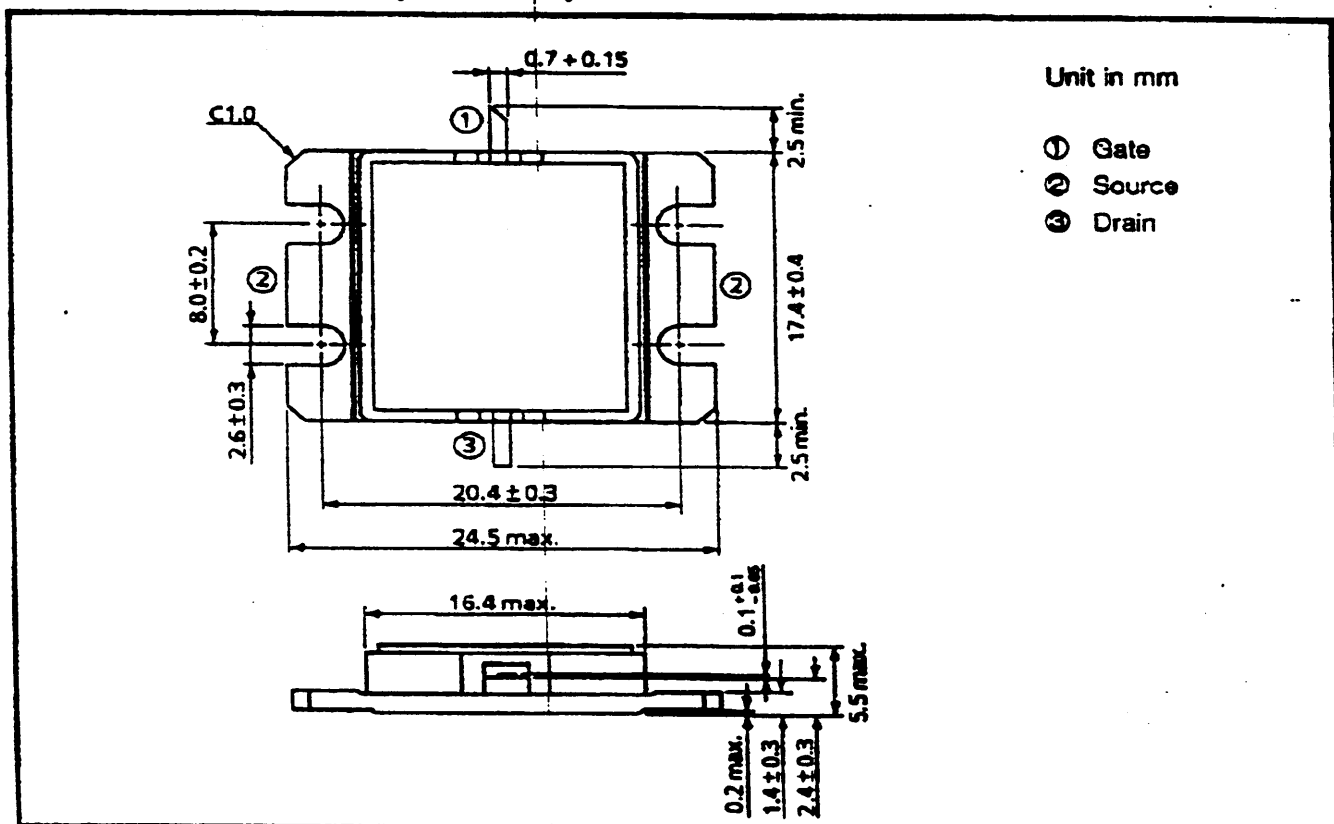
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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_{DS}	A	31
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_T	W	125
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{stg}	$^\circ\text{C}$	-65~175

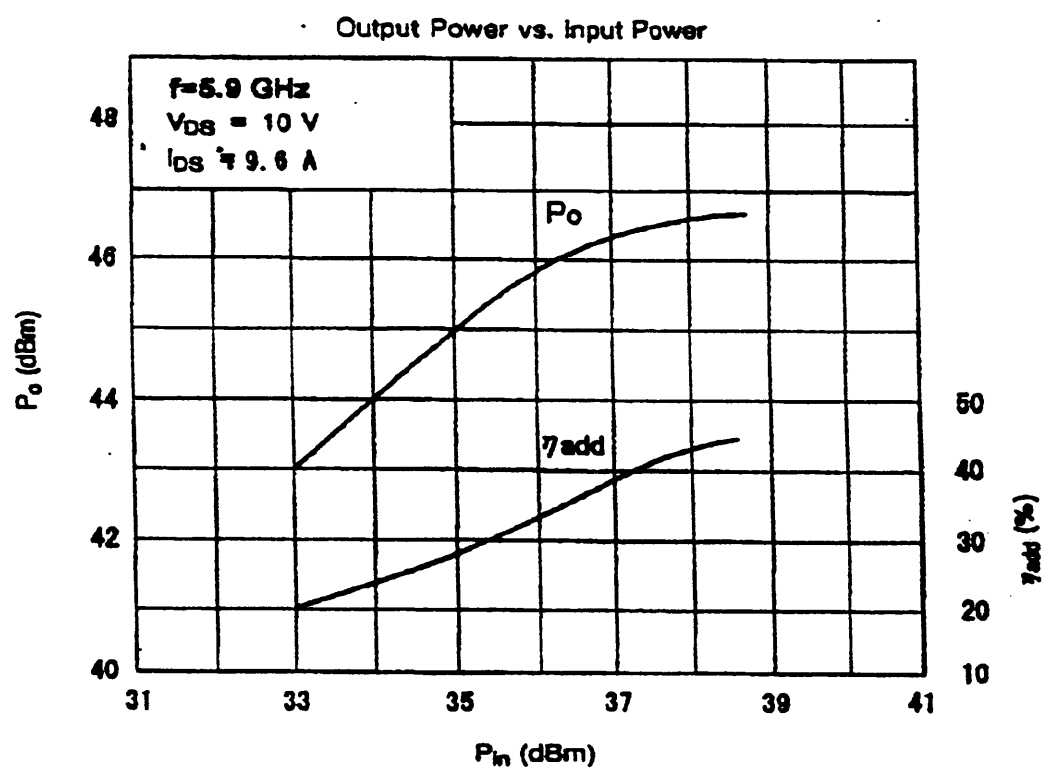
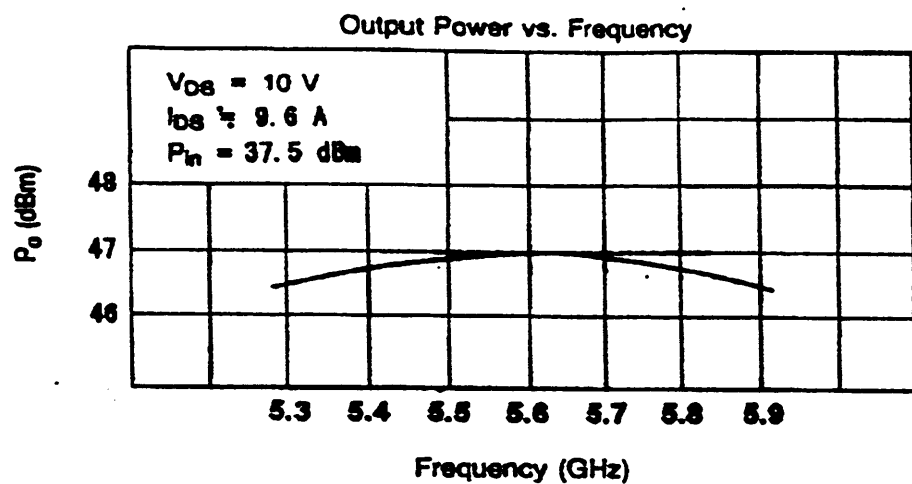
PACKAGE OUTLINE (2-16G1B)

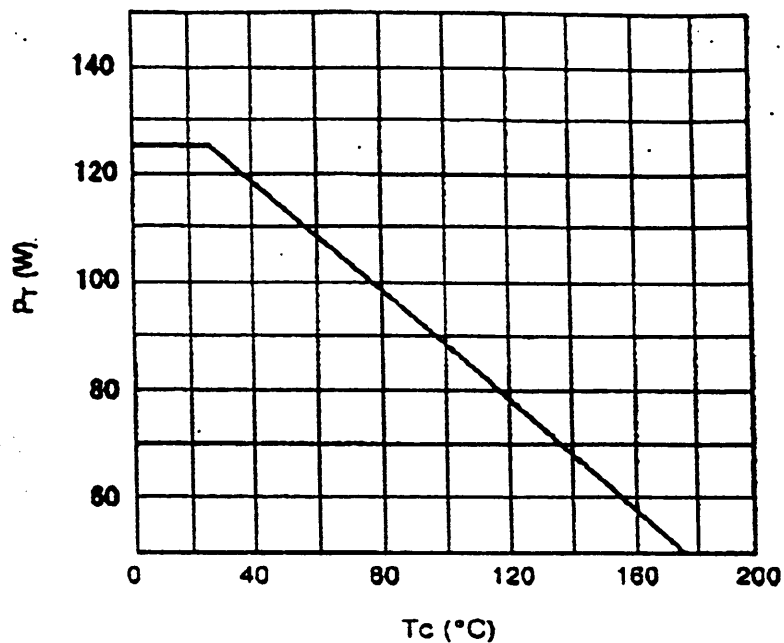
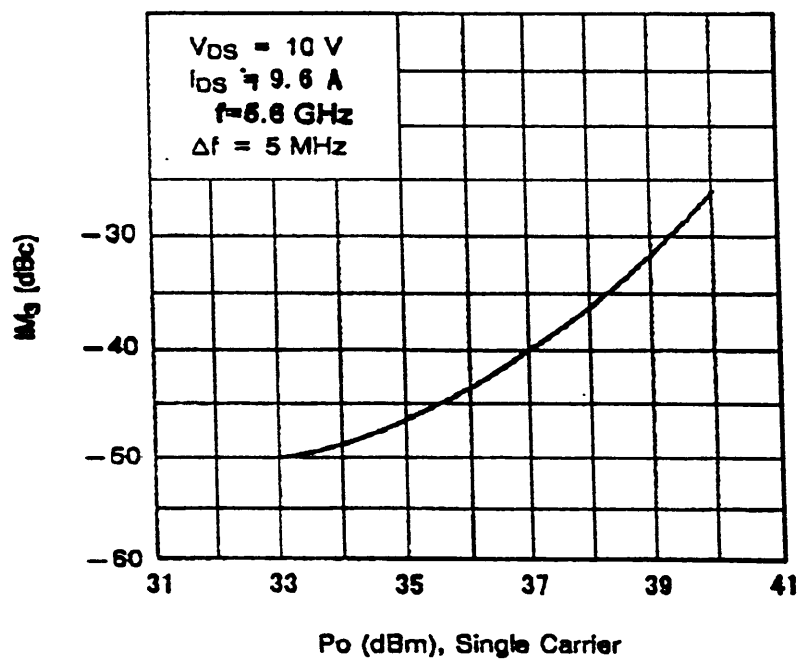


HANDLING PRECAUTIONS FOR PACKAGED TYPE

Soldering iron should be grounded and the operating time should not exceed 10 seconds at 250°C.

RF PERFORMANCES

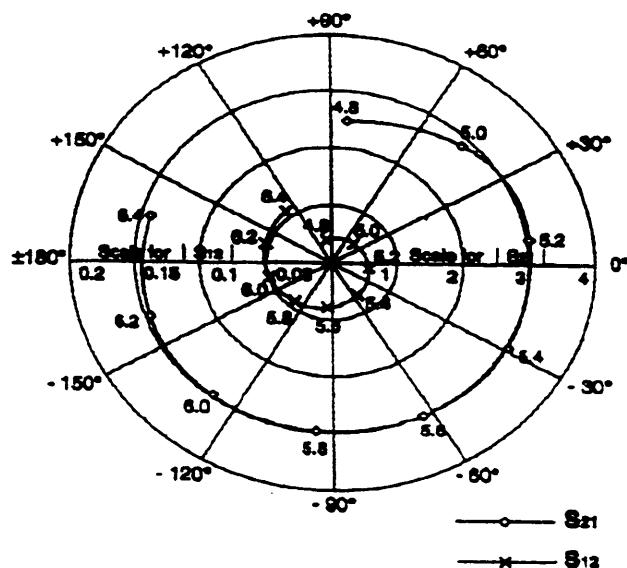
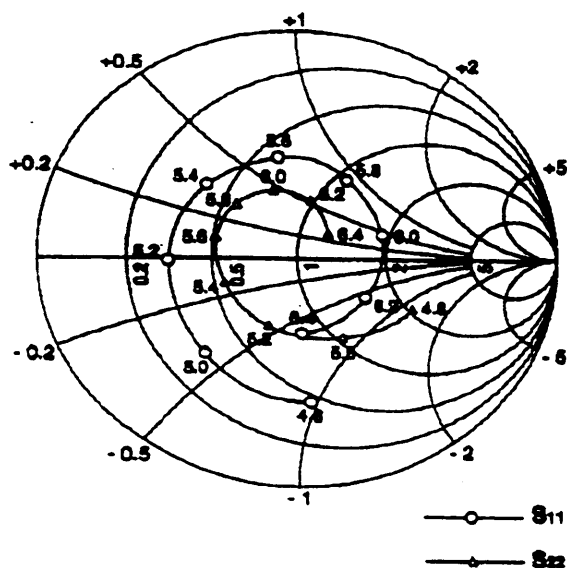


POWER DISSIPATION VS. CASE TEMPERATURE**IM₃ VS. OUTPUT POWER CHARACTERISTICS**

TIM5359-45SL S-PARAMETERS (MAGN.and ANGLES)

$V_{DS} = 10V, I_{DS} = 9.6A$

$f = 4.8 \sim 6.4GHz$



FREQUENCY (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
4.8	0.63	-86	2.47	84	0.020	100	0.49	-26
5.0	0.55	-131	2.85	46	0.024	44	0.38	-84
5.2	0.50	-179	3.03	8	0.029	-9	0.31	-111
5.4	0.47	137	3.05	-29	0.034	-55	0.30	-160
5.6	0.44	99	3.00	-63	0.039	-95	0.33	163
5.8	0.39	61	2.97	-95	0.044	-130	0.33	134
6.0	0.34	18	2.95	-128	0.049	-165	0.31	106
6.2	0.30	-33	2.92	-161	0.053	162	0.26	78
6.4	0.33	-88	2.85	164	0.056	128	0.16	43